

ICC-ES Evaluation Report

ESR-2850*

Issued April 1, 2009

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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07240—Exterior Insulation and Finish Systems

REPORT HOLDER:

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EVALUATION SUBJECT:

TESS™ THINSET EXTERIOR SURFACING SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 2006 *International Residential Code*® (IRC)

Properties evaluated:

- Weather resistance
- Wind load resistance

2.0 USES

The TESS™ Thinsset Exterior Surfacing Systems are used as exterior insulation and finish systems (EIFS) with drainage from behind the foam plastic insulation. TESS™ systems recognized in this evaluation report are limited to steel-stud framed walls of Type V-B construction, including Group R1, R2, R3, and R4 occupancies under the IBC, and construction under Section R703.9 of the IRC.

3.0 DESCRIPTION

3.1 General:

The TESS™ Thinsset Exterior Surfacing System is an EIFS that is attached to steel-framed exterior walls with plywood, oriented strand board (OSB), glass mat gypsum sheathing, water-resistant exterior fiber-reinforced gypsum sheathing, or water-resistant core gypsum sheathings; or to exterior walls constructed of concrete or portland cement plaster. The components of the wall covering system include a water-resistive barrier, mechanical fasteners, expanded polystyrene (EPS) insulation boards, a reinforcing mesh, a base coat, and a finish coat. Figure 1 shows typical construction details.

3.2 Materials:

3.2.1 Substrates:

3.2.1.1 Gypsum Sheathing: Water-resistant core gypsum sheathing complying with ASTM C 79 or ASTM C 1396, or water-resistant exterior fiber-reinforced gypsum sheathing complying with ASTM C 1278, or glass mat gypsum sheathing complying with ASTM C 1177, with a minimum 1/2-inch (12.7 mm) thickness.

3.2.1.2 Wood-based Structural Panel Sheathing: Minimum exterior-grade or Exposure 1 grade structural plywood, complying with U.S. DOC PS-1, or Exposure 1 OSB complying with U.S. DOC PS-2.

3.2.2 Water-resistive Barrier: The water-resistive barrier must be DuPont™ Tyvek® StuccoWrap® - Style 1062X as recognized in ICC-ES evaluation report [ESR-2375](#). The water-resistive barrier must be placed over the substrate and behind the insulation board, in accordance with [ESR-2375](#). The Tyvek® StuccoWrap® is also the system's drainage medium.

3.2.3 Insulation Board: Insulation boards must be expanded polystyrene (EPS) foam plastic insulation boards having a minimum thickness of 1 1/2 inches (38 mm) and a maximum thickness of 4 inches (102 mm), and recognized in a current ICC-ES evaluation report. The EPS board must have a nominal density of 1 pcf (16 kg/m³); a flame-spread rating of 25 or less and a smoke-density rating of 450 or less when tested in accordance with ASTM E 84; and must comply as a Type 1 board under ASTM C 578. Figure 1 provides additional details on the EPS board.

3.2.4 Fasteners: Fasteners used to attach sheathing to framing must comply with the applicable code. The EPS insulation is fastened with mechanical fasteners that consist of a 2-inch-diameter (51 mm) Wind Devil™ plastic washer, manufactured by Wind-lock Corporation, and a No. 8, Type S, corrosion-resistant buglehead steel screw having sufficient length to penetrate through the steel framing.

3.2.5 Base Coat:

3.2.5.1 TESS Base Coat: TESS Base Coat is a polymer-modified portland cement material. The product is packaged in 50-pound (22.7 kg) bags, with each bag mixed with 1 1/2 gallons (5.7 L) of water. The product has a shelf life of one year when stored in a cool, dry location, out of direct sunlight.

*Revised June 2009

3.2.5.2 TESS Base Coat CW: TESS Base Coat CW is a polymer-modified portland cement material. TESS Base Coat CW is for use when jobsite temperatures are between 35°F (1.7°C) and 50°F (10°C), and the substrate temperature is a minimum of 40°F (4°C). The product is packaged in 50-pound (22.7 kg) bags and is mixed with 1½ gallons (5.7 L) of water. The product has a shelf life of one year when stored in a cool, dry location, out of direct sunlight.

3.2.6 Reinforcing Fabric: The reinforcing fabric consists of fiberglass mesh that has been treated for alkali resistance, that weighs 4.5 to 4.8 oz/yd² (152 to 163 g/m²), and that complies with ASTM D 4029.

3.2.7 Primer: The optional TESS primer consists of a latex polymer, portland cement mixture and may be applied over the base coat as a color base for TESS finishes. The primer is applied to the base coat with a paint roller. The product is packaged in 20-pound (9.1 kg) bags and has a shelf life of one year when stored in a cool, dry location out of direct sunlight.

3.2.8 Finish: TESS Finish is a portland cement and polymer material jobsite-mixed with water prior to application. The product is packaged in 44-pound (20 kg) bags, and has a shelf life of one year when stored in a cool, dry location, out of direct sunlight.

3.2.9 Sealant: Elastomeric joint sealant must be compatible with the EIFS components and must be recommended by Formulated Solutions, LLC. Evidence must be submitted to the code official showing that the manufacturer-recommended sealant complies with ASTM C 920 as a Type S or M, minimum grade NS, minimum Class 25 or Use O sealant. Under the Use O classification, the sealant must be qualified for each material to which the sealant is applied. The details for sealant installation, including the width and depth of the sealant, must be designed by the registered design professional, the designer, the builder or Formulated Solutions, LLC, in that order, to the satisfaction of the code official.

4.0 DESIGN AND INSTALLATION

4.1 General:

Installation of TESS™ wall covering systems must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

The temperature of the substrate and the surrounding air during application of water-based materials must be 40°F (4.4°C) or higher, and must be maintained until the materials are fully cured. TESS CW Base Coat may be used when ambient temperatures are 35°F (1.7°C) or higher. If water is required to be added to improve workability, the minimum possible amount of potable water must be used. Water-based materials that have not yet fully cured must be protected against freezing and precipitation. The manufacturer's published installation instructions must be followed for all application procedures. See Figure 1 for typical installation details. Wall framing members must be designed to resist positive and negative transverse loads. Steel framing members must be minimum No. 18 gage [0.0478 inch (1.214 mm) base-metal thickness], spaced a minimum of 16 inches (406 mm) on center.

4.2 Water-resistive Barrier and Trim:

Before the insulation boards are attached, the trim pieces and the water-resistive barrier must be installed in accordance with [ESR-2375](#). When use is over wood-based sheathing in exterior applications, two layers of a water-

resistive barrier must be applied over the sheathing in accordance with IBC Section 2510.6 or IRC Section R703.6.3. The trim is installed, in accordance with the manufacturer's published installation instructions, at the bottom of all wall areas, including the base of walls, window heads, door heads, wall-to-roof intersections, wall-to-soffit transitions, and similar locations. Windows must be flashed in accordance with the applicable code. The water-resistive barrier must be installed in accordance with the manufacturer's installation instructions.

4.3 Insulation Board:

The EPS insulation boards must be a maximum of 2 feet by 4 feet (610 mm by 1219 mm) and must be placed in running bond and attached to steel framing with fasteners as described in Section 3.2.4 spaced at 8 inches (203 mm) vertically.

When the substrate is wood-based sheathing, the insulation board is held in its final position on the wall, and the washer-with-screw is driven through the insulation and into the wood-based substrate until the washer is flush with, or slightly below, the surface of the insulation.

Joints between adjacent boards must be tight, with gaps filled with insulation or sealant. Insulation board vertical joints are offset a minimum of 6 inches (152 mm). Boards at corners are interlocked. The insulation board surface must be roughened by rasping.

4.4 TESS Base Coat and Reinforcing Fabric:

Prior to application of the insulation boards, a minimum 4-inch-wide (100 mm) strip of reinforcing mesh, to be used as back-wrapping, is adhered around the edge of the base of the EPS boards wall using TESS Base Coat. This strip of reinforcing mesh will back-wrap around the edge of insulation boards a minimum of 2½ inches (64 mm) on the face of the insulation board.

The TESS base coat must be mixed with water until the mixture is uniform. The base coat is applied to the insulation board, using a straight edge steel trowel, to a minimum ⅛-inch (3 mm) thickness. The fiberglass mesh must be embedded into the wet base coat. Edges of the mesh must be overlapped a minimum of 2½ inches (63 mm). Additional mesh must be applied at corners, doors and windows. Any exposed mesh must be covered with additional base coat material. The base coat must be cured for a minimum of 24 hours.

4.4.1 Primer: The optional TESS primer is applied to the cured, clean base coat with a roller. The primer cures overnight at temperatures between 40°F and 100°F (4°C to 38°C).

4.4.2 TESS™ Finish Coat: The finish coat is mixed with water until the mixture is uniform, is applied to the cured base coat or optional primer with a straight edge steel trowel, and is smoothed using a plastic float trowel. The finish coat is textured to achieve the desired appearance.

4.4.3 Joints: Expansion joints are required in TESS™ wall systems at the following locations: where the substrate changes; at floor lines in framed construction in which lumber shrinkage will occur; where the EIFS abuts another material; and where structural movement is anticipated. Joints must be installed as specified by the architect, designer, builder or TESS™ system manufacturer, in that order.

4.4.4 Sealants: An approved sealant as described in Section 3.2.9 must be applied at system terminations, exposed joints, floor lines of framed construction, changes in building shape or roof line, substrate changes, and expansion joints.

4.5 Allowable Transverse Wind Loads:

The allowable wind load on the system with steel studs at a maximum of 16 inches (406 mm) on center is 20 psf (0.96 kPa) negative and 60 psf (2.87 kPa) positive. Supporting framing and sheathing must be adequate to resist the required wind load.

5.0 CONDITIONS OF USE

The TESS Thinset Exterior Surfacing System described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 Installation must be by applicators qualified by Formulated Solutions, LLC.
- 5.3 Foam plastic insulation boards must be separated from the building interior with a thermal barrier complying with the applicable code.
- 5.4 Installation cards, such as those shown in Figures 2 and 3, must be completed by the applicators and presented to the code official at the completion of each project.

5.5 In areas where the probability of termite infestation is very heavy, installation must be in accordance with IBC Section 2603.8 and IRC Section R320.5.

5.6 Systems are limited to Type V nonfire-resistance rated construction under the IBC and construction under the IRC.

5.7 The allowable wind load on the system is as described in Section 4.5. Supporting framing and sheathing must be adequate to resist the required wind load.

6.0 EVIDENCE SUBMITTED

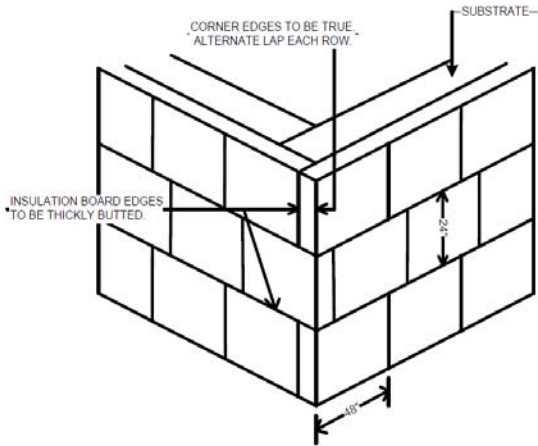
Data in accordance with the ICC-ES Acceptance Criteria for EIFS Clad Drainage Wall Assemblies (AC235), dated October 2004 (editorially revised April 2008).

7.0 IDENTIFICATION

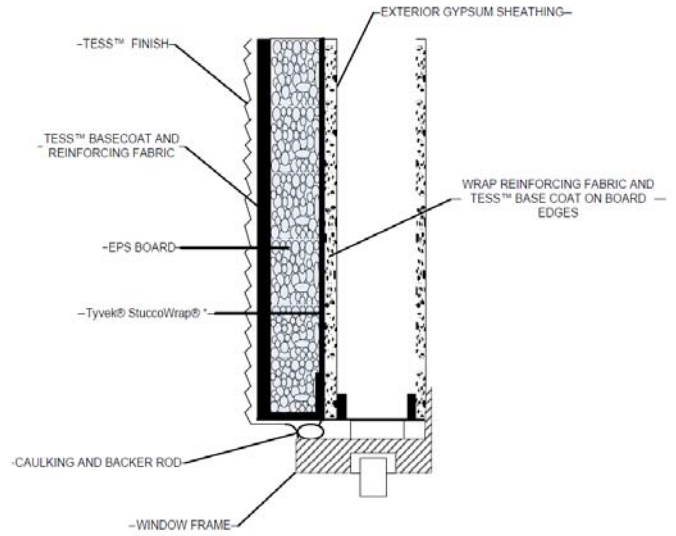
Bags of the TESS™ materials described in this report are identified by a label bearing the manufacturer's name (Formulated Solutions, LLC); the product type; the batch number; the expiration date; and the evaluation report number (ESR-2850)

The EPS foam insulation boards must be labeled in accordance with their current ICC-ES evaluation report.

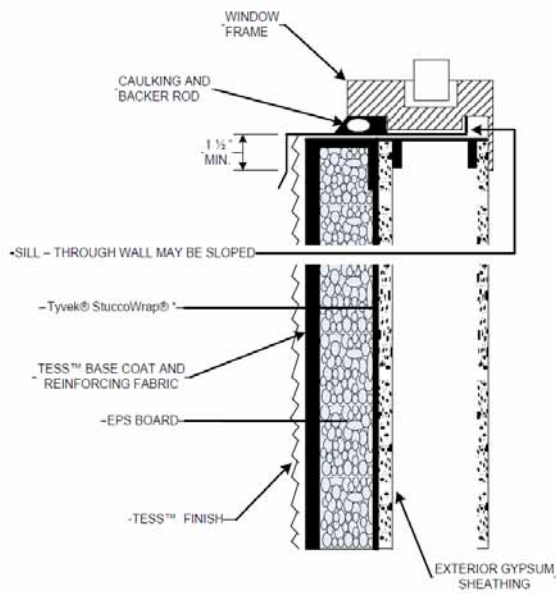
EPS INSULATION BOARD LAYOUT



HEADERS AND DOOR JAMBS



WINDOW JAMBS



FOUNDATIONS

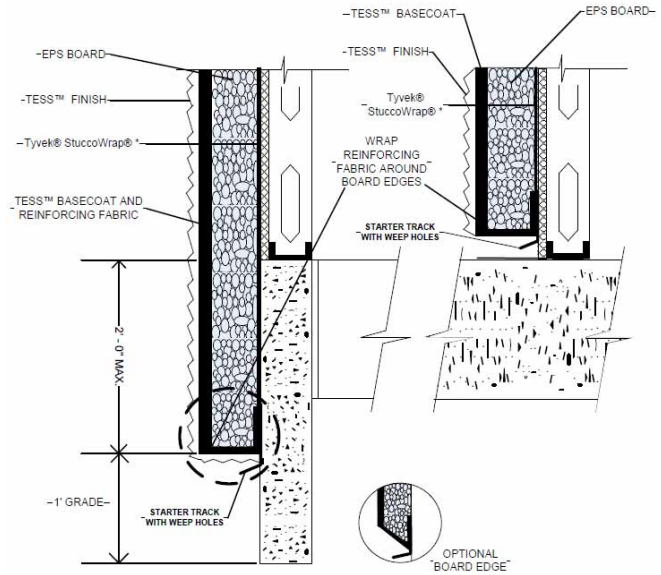
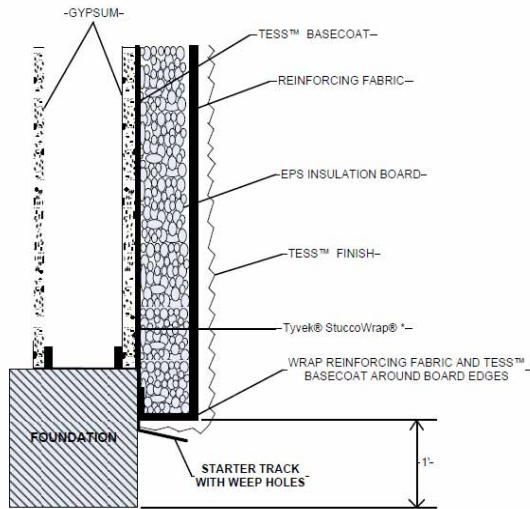
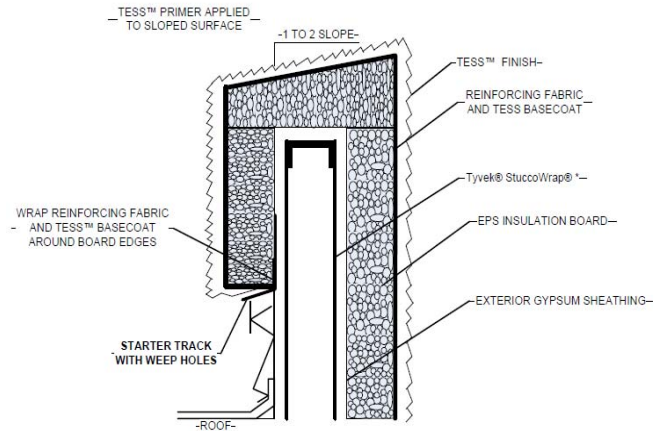


FIGURE 1—CONSTRUCTION DETAILS

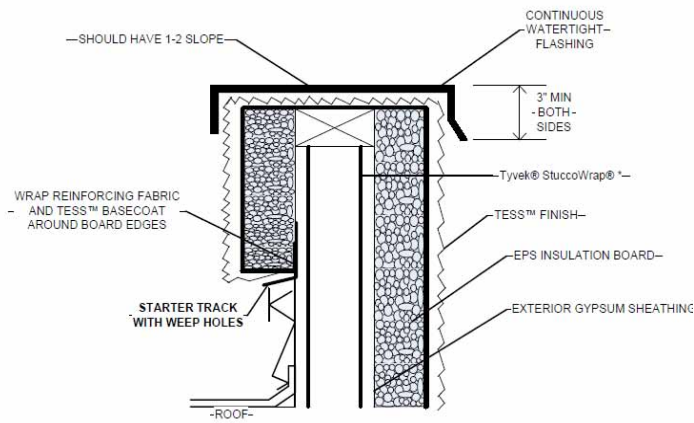
WALL STOP



PARAPETS



PARAPETS



SOFFITS

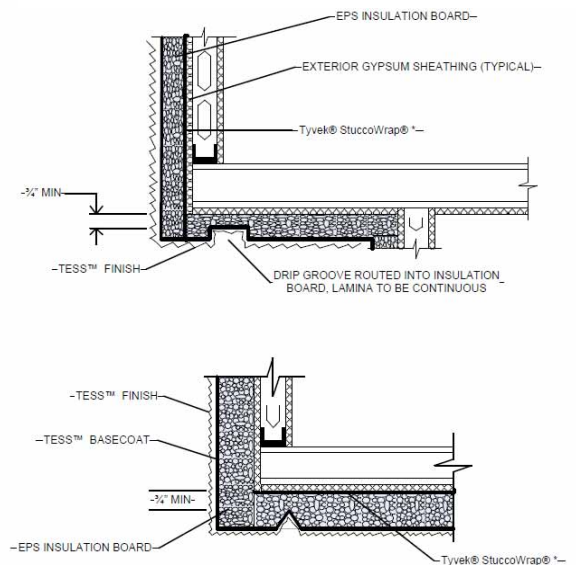
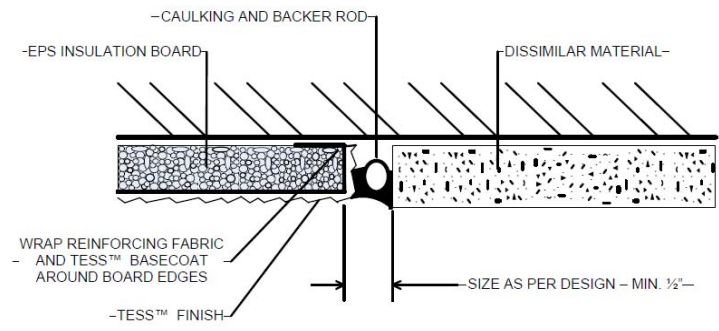
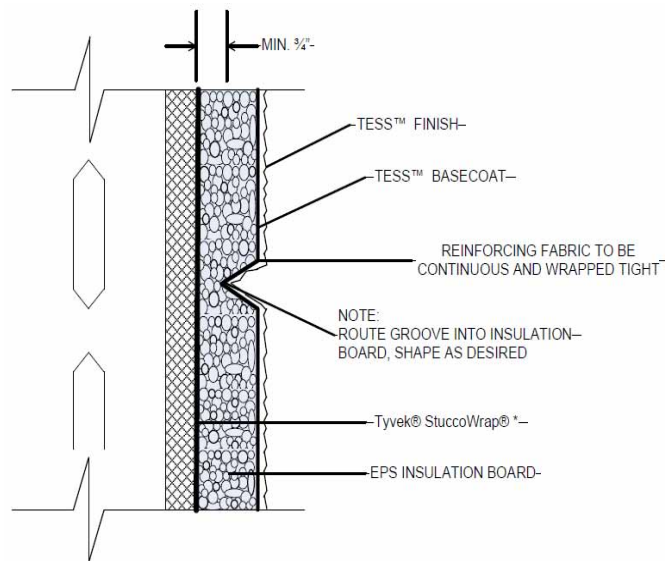


FIGURE 1—CONSTRUCTION DETAILS (Continued)

ABUTTING DISSIMILAR MATERIALS



V-JOINTS



INSIDE CORNER CAULK

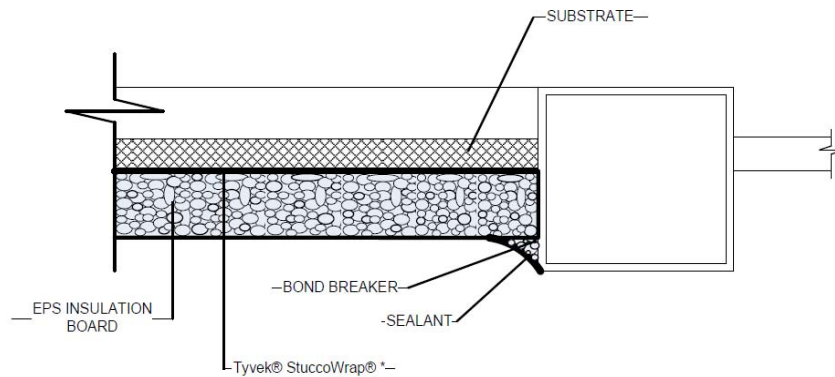
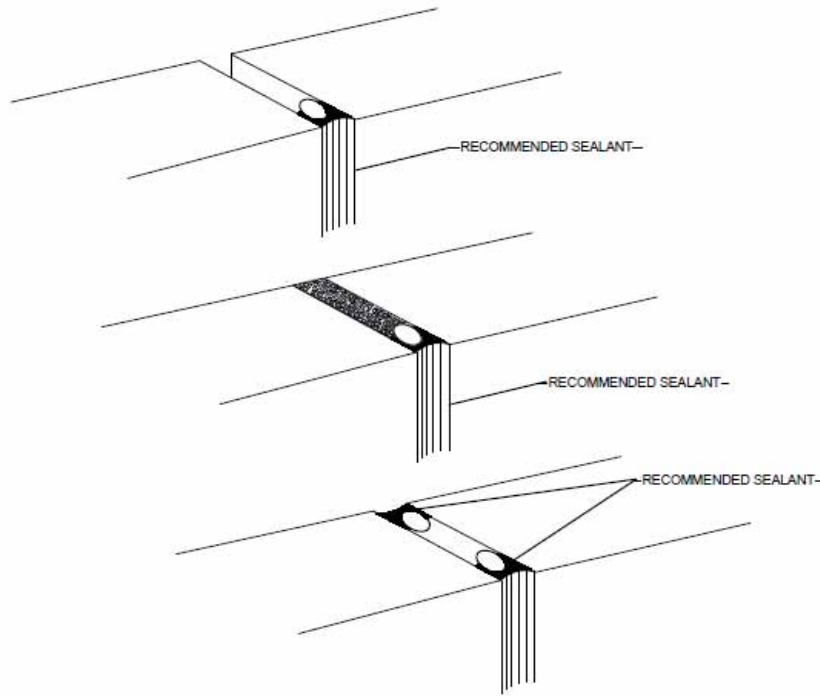


FIGURE 1—CONSTRUCTION DETAILS (Continued)

CAULK JOINTS



EXPANSION JOINTS

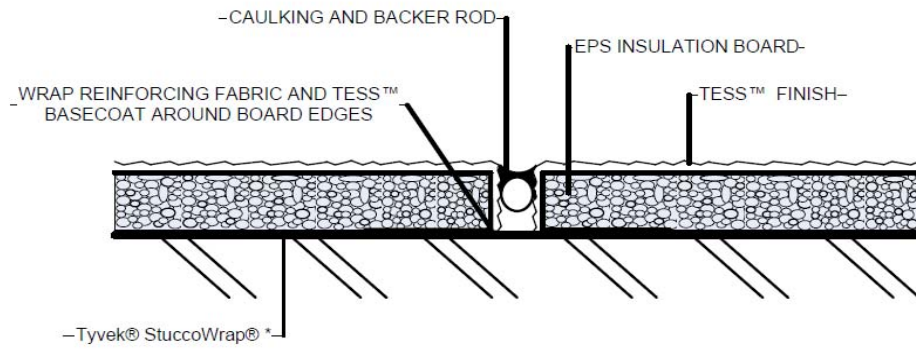


FIGURE 1—CONSTRUCTION DETAILS (Continued)